

MULTIMEDIA



UNIVERSITY

STUDENT ID

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2018/2019

TDM7011 – Advanced Data Management

(All sections / Groups)

21 MAY 2019
10.00 a.m - 12.00 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 5 pages, including the cover page, with FOUR questions only.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the answer booklet provided.

Answer ALL Questions**QUESTION 1**

- (a) Explain the 3 Vs of big data.

[3 marks]

- (b) Answer questions (i) and (ii) based on the following scenario:

Assume that you are working in an international company that sells printers. Your company is in the process of implementing a data warehouse for sales evaluation.

- (i) As a data warehouse consultant, you are asked to identify the sources for extracting relevant data for the data warehouse. What are the suitable data sources? Briefly explain your answer.

[2 marks]

- (ii) Design a star schema for the data warehouse. Identify *at least* four dimensions and the fact table for sales revenue. The star schema should be complete with relevant dimension and fact tables, primary key, foreign key, attributes and relationships.

[5 marks]

Continued

QUESTION 2

Answer questions (a) to (c) based on the following relational schema about QQ CUP 2018 tournament. The primary key for each relation is in bold and foreign key is underlined.

Team (**TeamID**, TeamName)

Player (**PlayerID**, PlayerName)

PlayerTeam (**PlayerID**, **TeamID**, TypeID)

Type (**TypeID**, Position)

Match (**MatchID**, MatchDate, Visit TeamID, Home TeamID, VisitScore, HomeScore)

Note: The foreign keys, Visit_TeamID and Home_TeamID in Match table reference the Team table via TeamID.

- (a) Assume that Team, Player and Type tables are created; write a SQL statement to create the PlayerTeam table. You may assume any suitable data types for the attributes in the table.

[3 marks]

- (b) Write a SQL statement to list the player name, team name and their playing position on the field.

[3 marks]

- (c) Write a SQL statement to list the team name, who played in a match as home team in the month of April 2017 and December 2017. The results of your SQL should remove duplicates of team name, i.e., only show the unique team name.

[4 marks]

Continued

QUESTION 3

- (a) "Distributed processing does not require a distributed database, but a distributed database requires distributed processing." Why is that so?

[2 marks]

- (b) Given the following EMPLOYEE table:

EmpID	Name	Location	SavingBalance	CreditCardDue
S1	Martin	Cyber	1800	2014-09-20
S2	Simon	KL	5400	2014-10-01
S3	Dillon	KL	60	2014-10-29
S4	Albert	Cyber	200	2014-09-21

Partition the EMPLOYEE table using the *mixed fragmentation* strategy. Show the resulting tables contents.

[6 marks]

- (c) Convert the following XML data to relational data. Show the resulting relational table with attributes:

```
<?xml version="1.0" ?>
<registration>
  <student>
    <stuid>S1</stuid>
    <crsid>TDM7701</crsid>
    <grade>B</grade>
  </student>
  <student>
    <stuid>S2</stuid>
    <crsid>TMA7098</crsid>
    <grade>A</grade>
  </student>
</registration>
```

[2 Marks]

Continued

QUESTION 4

(a) Suppose you have a collection of `Student` in your MongoDB database. Answer questions (i) to (iv) based on this `Student` collection.

(i) You are given the following information of a student. Write a NoSQL command to insert the following information into MongoDB collection called `Student`:

StuID: 100 Name: Ali Faculty: FCI Final: 28 Coursework: 35
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[1 mark]

(ii) Using the `update()` function, write a NoSQL command to modify the name of the student to 'Ali Mahmod' for student whose ID is 100.

[2 marks]

(iii) Using the `aggregate()` function, write a NoSQL command to count the number of students registered in each faculty.

[2 marks]

(iv) Using the `aggregate()` function, write a NoSQL command to calculate the total marks (i.e., `Final + Coursework`) obtained for each student.

[2 marks]

(b) Explain briefly the constructive merge operation performed during the loading phase of the extraction, transform and loading (ETL) process.

[3 marks]

End of Page